AN ENQUIRY INTO THE Causes of Diseases IN GENERAL, AND THE Disturbances of the Humors IN MAN's BODY:

Wherein the Nature of the Blood, of the Air, and of a Pestilential Constitution, are briefly considered.

Together with some Observations, shewing wherein the Venom of Vipers, particularly that of the *English* ADDER, does consist.

By *Stanford Wolferstan*, M. A.

Οὐκ ἄλλοθέν ποθεν εἰκὸς ἐστι γίνεσθαι τὰς ἀῤῥωστίας μάλιστα ἢ ἐντεῦθεν.
Hippocrates lib. de Flatibus.

LONDON,
Printed for Thomas Basset, at the *George* in *Fleet-street*, 1692.

1396.16

To the Right Honourable

FRANCIS,

L^d. *Carrington*,

Baron of *Wotton*, Viſcount *Berriſore*, in the KINGDOM of *IRELAND*.

My Lord,

THere are Two things the world may, perhaps, wonder at: Firſt, My Confidence in divulging

my own Opinions after ſo many great Men, in ſo learned an Age. And Secondly, My Preſuming to preſent them to ſo Honourable a Perſon.

In anſwer to the Firſt, I muſt needs ſay, That the Diſſatisfaction I have met withal in Books, (as to moſt of theſe things) made me reſolve to ſpeak my own Thoughts. And, as to the Second, Your Lordſhip's

ſhip's great Judgment in theſe Studies, and Regard for them, lately Honouring the Faculty, with Encouraging ſo near and worthy a Relation of Your own in theſe Studies: Together with Your Lordſhip's condeſcending Attention, and favourable Regard to my weak Diſcourſes, ſometimes on ſuch Subjects. Theſe things, my Lord, have emboldned me to pre-

ſent theſe Phyſiological Enquiries; which I offer with a very grateful Acknowledgment of Your Lordſhip's condeſcending Favours to,

My Lord,

Your Lordſhip's

moſt Obedient

humble Servant,

Stanford Wolferſtan.

THE PREFACE.

NOtwithſtanding *the voluminous Authors that we have in Phyſick, both* Greeks, Arabians, *and latter Commentators, Phyſick till of late (ſince the days of* Hippocrates) *hath received but ſmall improvement; for if the Circulation of the Blood (on which both the Theory, and Practice*

ctice of Phyſick ought to be built) was diſcovered by Solomon *Ænigmatically by a Wheel; he was never till of late underſtood. If* Andreas Cæſalpinus *knew any thing of it, that knowledge till of late was never improved; no Methods of Practice were built on it. The preſent ſtate of the Art of Phyſick is juſt like that of War, both have received conſiderable Improvements, the one to ſave, and the other to deſtroy Mankind. The Practical part of Phyſick, without the Theory, is like downright fighting without the Wiſdom and Conduct of General Officers; and we ſee more Towns taken, and Countries over-run by the prudent Con-*

duct of Commanders, than either by the use of Gun, or Pike. The Practice of Physick without the Theory, being just like a great House, built without Foundation, which, however it may appear fair at first unto the Eye of the beholder, will quickly tumble into ruine, and disorder. For, as I remember an eminent Physician hath lately told us, If the Art of Physick did consist only in telling Medicines, or writing Receipts, the Apothecary will excel the most learned Physician, the prating Shop-Boy his Master, a Nurse or talkative Woman, full of her antiquated Book-Receipts, will carry the Prize, and Glory from them all: Whereas if the true

Dr. Walt. Harris.

true Theory of Diseases were first well known, fewer Medicines would serve turn, and Practice would be much more successful than generally it is. I have here only shewed, what gives the first disturbance unto the Humours of our Body; the next Enquiry will be, What Humors are the first disturbed; the manner of their disturbance; the Effects of, and Remedies to each particular disorder: And if the Success be answerable to the Hypothesis, then it will appear, that the Theory of Physick is a most necessary part of that Study.

I must confess I have laid aside my Books, in these Physiological

logical Enquiries, to ſpeak my own Thoughts; ſo that if the Reader finds here any Opinions contrary to his own, or his beloved Author, let him not too much blame me for it, there being a Libertas Philoſophica, *as well as a* Licentia Poetica; *which Liberty I hope I have no way abuſed.*

If he reap any Benefit, or Satisfaction from it, he is partly obliged to that great and general Want or Defect, that firſt occaſioned it; for which you may take the word of our learned Profeſſor, Dr. Brady, *in his Epiſtle to Dr.* Sydenham: Nemo uſpiam Medicorum, adhuc vim aeris & influenti-

am

am in humana corpora attente perpendit, nec in vita noſtra perennanda quas agit partes eorum quiſpiam conſideravit ſatis, &c.

An Enquiry into the Causes of Diseases in general, &c.

Chapter I.

FOrmer Physicians were wont diligently to enquire, what solid Parts in their sick Patients were ill-affected, and to look for the Cause of a Disease, either into the solid Parts they found so ill-disposed; or the four ἰδέας ὑγρῶν, *humidi formas*,

formas, vel Species, as *Hippocrates* calls them: *Hæ vero sunt*, as it follows, *Pituita, Sanguis, Bilis, & Aqua*: Whereas indeed there is but one of these, *humor Corporis*, in a true Sense, which is the Blood it self; the other three being only the Recrements of that Blood.

No wonder then that the Antients were mistaken in the true Causes, and right Names of Diseases, since they did not well enquire into the Nature of the Blood; and were indeed very ignorant of many Humors in the Body.

But

But our Modern Phyſicians finding this Error, (eſpecially ſince the Days of Dr. *Harvey*) have both Chimically anatomized the Blood, and other Humors of our Body, and diligently endeavoured to obſerve their Nature, Variations, Alienations, and Effects; they more juſtly ſeem to find the immediate Cauſe of many Diſtempers in the Humors; who in their wandring Motions about the Body, do diſaffect, and diſturb the ſolid Parts, which elſe before were very ſound, and quiet.

From hence, in the Writings of the Moderns, we find new Diſeaſes, new Cauſes, and new Names, according to the various ill Diſpoſition, Alienation, (or ſuppoſed ill Fermentation) of thoſe Humors.

But what gives Diſturbance firſt unto thoſe Humors, is now become the grand Queſtion amongſt learned Men.

Some believe the Cauſe to be in the Humors themſelves; and as the Ancient Phyſicians very often placed the Cauſe of a Diſeaſe in the ſolid Parts, ſo now we have the *Morbi Salivæ*, *Morbi Chyli*, *Succi Pancreatici*, *Lymphæ*, &c.

And

And yet the ſeveral Humors are ſo fitted for each others Service, and the great Ends they are deſigned for; they ſo regularly perform their Offices, and are ſo well prepared for one another, that we may rather wonder we live not the Age of the Patriarchs, than that we are ſo often diſturbed by any Inteſtine War amongſt them; for if the Mouth receive nothing but what is fit as to the nature and quality of the Aliment; if it exceed not in quantity, if it ſtay there its juſt time, Maſtication is performed regularly, the *Saliva* will mix with it, and the

Stomach will perform its office, in the Maceration, Digestion, and Expulsion of it; the Pancreatick Juice, Lympha, *&c.* are fitted for their several duties, of Separation, Attenuation, and Dilution of the Chyle, without any preternatural Commotion, to disorder or disturb one another: Nor does the Blood quarrel with the well prepared Chyle, but amicably receives it, from the *Ductus Thoracicus* into the *Subclavian* Vein, and as amicably passes with it into the right Ventricle of the Heart; where, though in the Diastole they are more mixt together, yet

they ſtay not to make that buſtle ſome have thought; but by the Syſtole, or Contraction of the Heart, are ſoon driven out again, the Chyle accompanying the Blood to the greateſt amongſt all the *Viſcera* for Sanguification; I mean the Lungs, where they both receive a florid Red, and by the admiſſion of new Particles, are more perfectly aſſimulated, or united with each other.

So that even in Fevers, which ſeem to give the greateſt diſturbance to the Humors of our Body, the diſturbance does not firſt ariſe from a quarrel raiſed amongſt

the Humors of our Body; for as long as no ſtrange ill Gueſt comes in to diſturb them, they all perform their natural offices in their wonted order; but if they are hindred, or diſturbed in their Operations by an Enemy, they then fall into tumult and diſorder.

The Blood does not quarrel with its ſelf, nor one part of it with another; for really there is no Fermentation truly and properly ſo called in it, neither (according to the ſuppoſed Fermentation) does one part act upon or againſt another: For,

I conſider the Blood, not as it is Chymically analyzed into their Principles, but as it is a viſcous Humor, whoſe Particles are not fermented, but combined together, by an Aereal Salt, receiving Heat from its own Motion and Circulation round the Body, whoſe Recrements are ſeparated from it, by the various and admirable Contexture and Configuration of the Veſſels through which they paſs, whilſt the viſcid Humor, or thick part of the Blood, keeps cloſe and entire, and by the Anaſtomaſes, which, I ſuppoſe, (whether viſible or not)

of the Veins and Arteries, is brought back to the Heart, a languid Pulſe being continued by the extremities of the Arteries to every Veſſel, which helps forward the Separation, Secretion, Percolation (or which you ſhall pleaſe to call it) of the thinner Humors.

I ſhall not ſtay here further to ſhew, either the incapacity of the Blood, or unfitneſs of the Veſſels through which it paſſes, nor the danger of ſuch Heterogeneous fermenting Liquors, eſpecially near the extremity of ſuch ſmall, fine, and thin Veſſels through which theſe Liquors,

quors, of ſuch different fermenting Particles, muſt violently paſs; neither ſhall I ſhew how the Viper, and ſeveral other Animals that ſleep all Winter, whoſe Blood is not denied to Circulate all that while, neither void any Excrements all that while; nor is their Bladder of Gall fuller when they firſt come forth in the Spring, than when in Winter they firſt took their Beds; to demonſtrate that either the Blood does not always Ferment, or that the Gall is not thrown off by ſuch a Fermentation. So that as I cannot believe Diſeaſes, with the Ancients, ſo

so often to arise from the solid Parts, nor the Blood to consist of their four Humors; neither can I believe such a bustle kept in our Body, as hath of late been talkt of; I neither believe the solid Parts, nor Humors of our Body, to conspire our ruine.

CHAP.

Chap. II.

SO that whatever Commotion, Fermentation, Ebullition, or Diſturbance there is raiſed in the Blood, or Humors, muſt ariſe preternaturally, and *ab extra*; for elſe neither Blood nor Humors will, of themſelves, raiſe ſuch violent Commotions, or Diſturbance in Man's Body.

It is unqueſtionably true, That the Air, above all the other Non-naturals, is the great

great Cauſe of our Epidemick Fevers; the beſt way therefore to know the nature of ſuch Fevers (next to the knowledge of the Blood) will be to conſider the Nature of the Air we breath in.

I ſhall not enlarge here concerning the various Opinions of Philoſophers, concerning the Nature of Air; neither ſhall I determine from whence it does ariſe, or of what compoſed, it being two large a diſcourſe for my preſent purpoſe; but I ſhall only ſuppoſe the Air to be a very thin and fluid Body, combined moſt ſtrictly

ly with a Nitrous Salt, and by the preſſure of other Particles, together with its own natural fineneſs and ſubtilty, pervading every Patulous Pore in Earth and Water.

I ſay Patulous, becauſe I deny not, nay, I affirm there are many Pores, eſpecially in the Earth, which the Aereal Particles are not fine enough to enter; and indeed both Earth and Water do reſiſt its penetration, but not with equal force, for the Air cannot enter very far into the more ſtrictly united and combined Particles of Earth; but the groſſer parts of the

Aereal

Aereal Salt, are neceſſitated to ſtick faſt; from whence, with eaſie trouble, we extract our common Niter.

Whereas the Particles of Water being more flexile, and not ſo cloſely combined together, recede, and give way to its penetration.

So that this Aereal Salt enters to the bottom of the deepeſt Waters; without which the very Eels (though bedded in the Mud) cannot live; and Carps have been known to live by Air only two or three days out of Water; both which Experiments

ments are beſt manifeſt in extreme cold and froſty times, when the Ice does prevent the ingreſs of Aereal Particles into the bottom of the Water, and the Cold does condenſe them for the others preſervation.

In great Froſts I have known, in Ponds quite frozen over, multitude of Fiſhes, for want of Air, ſometimes as it were ſmothered, ſometimes ſick, and faintly ſwimming towards ſmall vent-holes, where Air was let in to them, by breaking the Ice to keep them alive.

But

But to this I have heard ſome anſwer, That they have never broke their Pools at all, and yet their Fiſh have done well: and it may be ſo ſometimes; for in a great Froſt the Water is very apt to ſink from the Ice, and leave a hollow in the ſides for the Air to enter; and I have been certainly told of Eels that have crept out of the Deep, and their warmer Mud-beds, for want of Air, and have lain dead at the ſides, in the extreme cold Winter: Which, had they been ſo much offended with cold, as ſome have thought they are, they might eaſi-

ly

ly have kept their former ſtations, and ſo have remained *ab hac cœli inclementia tuti.*

Or elſe perhaps ſuch Pools had Quick-ſprings running into them; unto the heads of which Springs the Eels will commonly ſwim up for Air, when the body of the Pool is quite froze over. Where, by the bye, let me alſo make this further Obſervation, That the greater and more ſubtle Fiſh, tho' they ſwim near the bottom, yet they chuſe to be directly under thoſe holes; by which it is apparent, that theſe Aereal Particles are nei-

ther reflected, nor refracted, but by the interposition of another body, which they cannot enter, being otherwise pres'd directly downward. But to return.

CHAP.

CHAP. III.

THE Air having this penetrating force upon Earth and Water, let us next enquire how it does enter human Bodies: And there are four ways by which it is commonly believed the Air may enter them. Either,

Firſt, By its Mixing its ſelf with what we eat, and ſo is carried to the Stomach: Or,

Secondly, It is received by Inſpiration into the Lungs, and ſo is carried to the Heart: Or,

Thirdly, By the Pores of the Body, and from thence to the Maſs of Blood: Or,

Laſtly, In Inſpiration to the Ventricles of the Brain.

The two firſt of which I think are only true.

As to the *Firſt*; I think it is undoubtedly true, That the Air does, or Aereal Parti-

cles

cles do, mix themſelves with what we eat; for whatever we eat muſt have numerous Pores, or elſe we could never chew it with our Teeth, nor digeſt it in our Stomach, or ſeparate Chyle from it; and I believe the Air may ſometimes enter theſe Pores; however it does enter the Mouth, and is preſſed down the *Oeſophagus*, either by the Aliment, or force of the Aereal Atoms naturally deſcending downward.

Secondly, It is apparent, both by diſſection and inflation of the Lungs, that the Air does enter from the *Lar-*

nix and *Bronchia* into the Veſiculary Cells; and there, whether by Adheſion or Diſſolution, does depoſite at leaſt ſome part of this Aereal Salt; where, meeting with the occurring Humors, is directly carried to the Heart, and by its pungent Particles, moleſting and irritating the ſtreight and oblique Fibres of the Heart, does ſtir them up into a Syſtole, or Contraction; and ſo by ſtreightning its Ventricles, to drive forth the Blood contained in them into the Arteries: And this I take to be the true Original of all Pulſation, and firſt Motion of the Heart,

and

and Circulation of the Blood throughout the Body.

For when I obſerve the Motion of the Hearts of ſeveral Creatures, exempt from their Bodies, and expoſed to the open Air, I can never believe either the Influx of Animal Spirits, much leſs the Ebullition, Accenſion, or Dilatation of the Heart, to be the Cauſe of its Motion, but rather the Effect of theſe pungent Particles, pricking upon the Fibrous *Parenchyma* of the Heart in their natural deſcending Motion.

As to the other two ways of receiving Air, *viz.* by the Pores of the Body; when I

consider the Nature of these Atoms pressing directly downward, when I consider the great Quantity of *Effluvia* that are continually transpired by the Cuticulary Pores; when I consider the Nature of those Pores, and their action to be continued suitable to the utmost extremity of the Arteries, from whence they originally are derived: I cannot see how the Air can enter without either *penetratione Corporum*, or an inversion of Natures constant Course, *à centro ad circumferentiam Corporis.*

The

The Arguments that are brought to prove the Poroſity of Animals, by the taking in of *Effluvia* from without, by the application of Oils and Plaſters, (if rightly conſidered) make nothing to this purpoſe, to prove the entrance of this Aereal Salt by the Cuticulary Pores; for ſetting aſide a particular enquiry into the Nature of thoſe Plaſters, their ſubtile, active, igneous, violent cooling, drying, irritating, ſtupifying, obſtructing, and preternaturally diſpoſing Particles, the Cuticulary Pores are not placed for the due reception of this Salt; nor have

have the points of this Salt a force upon them, since they naturally descend perpendicularly downward. Neither when I observe the difference between the Florid, Aereal, Coloured Blood returning from the Lungs, and the Atropurpureal Blood contained in the Veins, can I believe this Aereal Salt does enter by the Pores; or is mixt with the Venal Blood, when I see the Venal Blood both changed in colour and consistence from what I either find in the Lungs or Arteries.

And,

And, as to the laſt of theſe ways, when the Authors acquaint us how the Particles of Air are parted aſſunder in Inſpiration, part of them aſcending by the Mammillary Proceſſes *ad cerebri Vaſa, & Ventriculos*, and part deſcending to the Pulmonary Veſſels; when they can, I ſay, explicate with any great probability, how this is done, for what end, or uſe, the Air thus impregnated with this Salt ſhould come thither, it will deſerve further Conſideration. For,

Al-

Although the Mammillary Proceſſes may be affected by the Points of this Salt, and according to the various and different Modification of them, ſo various and different ſmells may be conveyed unto the Brain: Nay, although the Particles of this Salt are very different, as to their ſhape and bigneſs, ſize and figure, yet do I not ſee how, nor for what end or uſe, by theſe nervous Proceſſes, they ſhould ever be conveyed; neither can I ſee how theſe Nerves, or even the Brain it ſelf, ſhould eſcape a ſtrong Vellication by them, which, being com-

communicated by the Nerves, might cauſe a Convulſive Motion in every Member in the Body.

CHAP.

Chap. IV.

NOw as I have owned but only two ways by which this Aereal Salt can be received into human Bodies; so do I very much question, whether any thing else is left, in a healthy Air, to joyn either with Chyle or Blood, but this Aereal modified Salt only; which of its self is able to produce these great and following Effects:

First,

Firſt, This Salt as it is variouſly mixt or modified by the Aliment we take into our Mouths, ſo different Taſtes appear unto us, and either deſcending or preſt down by other Particles, cauſes that diſturbing Vellication on the inner Membrane of the Stomach (towards the upper Orifice eſpecially) where meeting with innumerous ſmall Branches of the Nerves, that ſeem as it were placed there on purpoſe to communicate that Vellication to the Brain, do occaſion that Deſire in us which we call Hunger; and from hence the taking the freſh

fresh Air does make us hungry, because we then receive this Aereal Salt both into our Lungs and Stomach.

But 'tis not the Fibres of the upper Orifice alone, but descending to the bottom of the Stomach with the Aliment, or what we eat, it has the same Operation on the other Fibres, and moves them to eject out at the *Pylorus*, and irritating all along on the Fibres of the Intestines, is a great cause of, and a considerable advantage to their Peristaltick Motion.

But though this Salt is so highly useful to the Motion of the Stomach, yet the Stomachical

machical Operations are not performed by it alone; for I have obſerved, near the *Rugæ* of great Animals, certain *Papillæ*, and a conſtant Juyce lodged in them; which I believed to be an acid *Lympha*, brought thither by inviſible Lymphatick Veſſels; which, we have great reaſon to believe, do moiſten the Fibrous Tunicles of the Ventricles, although they are not perceptible to our ſight.

I know I might have traced the generation of Animals, and have ſhewn not only how the *prima ſtamina*

vitæ, the Motion of the *punctum saliens*; nay, even the birth it self, is owing to this Salt.

As likewise I might shew the Effects of different occurring Salts that meet together in the *Duodenum*: But, designing brevity, I must hasten next to shew what great Effects this Nitrous Salt doth commonly produce upon our Blood: And, *First*, as to its Colour, it does change the Blood from an Atropurpureal Venal Colour, into a Coccineous Florid Red, which is performed even by common Salt mixt with Blood.

Se-

Secondly, To Combine, which is the proper Nature of all Salt mixt with Blood, as doth appear even from the vulgar, and commonly known, Methods of Lutation, Cementation, *&c.*

Thirdly, To hinder the Coagulation of the Blood.

Fourthly, By its lancinating and irritating Particles (ſuppoſed by ſome of a Comical Figure) to moleſt and vellicate the Fibres of the Heart, and give occaſion to its Motion; from which Mo-

tion, round the Body, does depend, its Heat, and all things else will follow in their order.

The first Effect of this Salt may yet more particularly be observed in the Blood returning from the Pulmonary Vessels, and from the Heart too, even to the Capillaries of the Veins and Arteries: Whereas the Venal Blood is changed both in Colour and Consistence, by the returning sub-acid *Lympha*, as Acids are used to operate upon it; especially by Coagulation, and changing

ing its Florid Red, into a Venal Atropurpureal Colour.

The Second Effect is alſo manifeſt by the expoſing Venal Blood, newly emitted from the Orifice, unto the open Air; for this Aereal Salt it is, that does not only change its Colour, but as far as it does penetrate its Pores, it firmly combines its Particles together.

Thirdly, To hinder the Coagulation of the Blood; which is another very common *Experiment* of theſe Salts,

whether taken inwardly, or elſe outwardly mixt with Blood; which it does Effect by intimately mixing it ſelf with the Blood, and ſo preventing a Diſlocation of the Sanguineous Particles.

Fourthly, 'Tis this Salt that by its irritating Particles, is the great promoter of Secretion in our Bodies, and yet maintains the *Vinculum* and due Craſis of the Blood entire; for as it gives a Saltneſs to moſt, ſo does it facilitate the Separation, Secretion, and Expulſion of almoſt every Humor.

And

And now we may ſee what gives diſturbance unto the Humors of our Body; for from the univerſal neceſſity of this Salt, we may eaſily diſcern what will enſue upon a total or partial Deprivation of it: Or, Secondly, what will follow upon a Depravation, or Contamination, eſpecially in our Blood and Humors.

Now as to the firſt of theſe, upon a total Deprivation of this Aereal Salt, this *Vinculum Miſtorum, & Naturæ*, what can enſue, but as total a diſſolution of Nature, a returning of all things

to their Primitive Chaos and Diſorder, an univerſal Mortality, not only to Mankind, but to all Creatures living? Beaſts and Serpents, Fiſh and Fowl, muſt all tumble together in one common ruine. So that with a little variation I may uſe *Lucan*'s Expreſſions for it:

---Sic quum compage ſoluta,
Secula tot mundi ſuprema coegerit hora,
Antiquum repetens iterum Chaos, omnia diſcors
Machina divulſi turbabit fœdera Mundi.

Lucan.de bello Civ.l.1.

Of

Of partial Defects, there are ſome more and ſome leſs deſtructive unto human Nature: And ſo Secondly, may Depravation, or Contamination be conſidered, as the Air is more or leſs depraved; but as a total Defect of this Salt was never yet known, ſo the direful Effects of a total Depravation were yet never felt, ſince a total Depravation; and a total Deprivation would prove alike equally pernicious: So that the Plague its ſelf, and all other Peſtilential Fevers, muſt ariſe from either a partial Defect, or partial Con-

Contamination, or Depravation of this Salt; from a total they can never come, becauſe that ſuch a ſtate there was never yet known, in the which Mankind were all deſtroyed together.

For neither the Suffocations of Lightning, nor hot Coals, make ſuch a total Defect; nor the Damps in the *Cryptæ*, and Subterranean Vaults, or Caverns, are ſuch a total Depravation of this Salt; yet, approaching only ſomething near that Nature, generally bring with them very ſudden ſwift deſtruction;

on; and Death is either more ſwift, or ſlow, as this Aereal Salt is more or leſs deficient or depraved.

As for thoſe partial Defects of this Salt, that are occaſioned by the default of the Organs of our Bodies, ſome way or other hindred in their Natural Motions or Operations, though they occaſion a Defect, yet generally very little, compared with the Defect is made for want of this Salt in the Air we breath in, which Nature cannot otherwiſe repair. And yet even in theſe partial Defects, when only one part of

of one Lobe of the Lungs is ulcerated, yet in how ſhort a time is the Motion, Colour, and Conſiſtency of the Blood changed from what it was?

There needs not therefore any thing, but a Defect of this Salt, to make thoſe Mutations in the Humors of our Body, from whence theſe Diſturbances which we call Diſeaſes do ariſe; as I might more particularly ſhew, if I did not deſign brevity in this diſcourſe: Nay, even the Air its ſelf does more or leſs ſuffer, according to the greater or leſs Defect of this Salt;

Salt; and I queſtion not, but even that venenate *Miaſme* (as *Hippocrates* firſt termed it) owes its Original to this want; and that his careful Deſcription of a ἡμπάϛασις λοιμώδης, does not ſo much argue a Corruption, or *Putredo*, as his Commentators call it, as this Defect which I plead for; from the want of which, the Humors of our Body will not only of themſelves corrupt, but if the want be great, there will infallibly enſue, ſome fatal or Peſtilential Conſtitution.

Which

Which Peſtilential Conſtitution, giving the greateſt Diſturbance unto our Blood and Humors, muſt conſequently be the moſt Deſtructive to Mankind: For when the Air is moſt deficient of this Salt, then other Heterogeneous Particles croud moſt into it, and do moſt corrupt; whilſt, in the mean time, for want of this Combining Salt, the Particles of our Blood are diſlocated, its *Craſis* made Lax, and prepared very ready to Receive and Combine with this Aereal Depravation.

Hæc

Hæc ratio quondam Morborum.
Lucretius lib. vi.

A Plague, thus rais'd, laid learned Athens *waſte;*
Through every Street, through all the Town it paſt;
Blaſting both Man and Beaſt with poys'nous Wind;
Death fled before, and Ruine ſtalk'd behind.

Mr. Creech's Lucretius.

CHAP.

Chap. V.

Since I have asserted a Pestilential Constitution to be nothing else but a Depravation of the Air, arising from a great Defect of this Aereal Salt; I need not determine on either side, whether this Depravation (arising from this Defect) does consist in *Acido*, or *Volatili Aeri*. As for the Body, the Consistency of the Blood being so almost totally altered,

tered, Acidity, Coagulation, &c. will naturally enſue, as the Stagnation of the Bile will render it more Acrid.

Now there is nothing as I have (yet) obſerved, doth more exactly repreſent, or expreſs the Nature of the Plague unto us, whether we reſpect the dreadful Symptoms, or the vulgar Method of Cure, than the firſt biteings of a ſtrong Viper, whoſe Venom does not conſiſt of a dull, heavy, ſluggiſh Poyſon, like unto thoſe Poyſons Authors commonly repreſent, and expreſs the Nature

of the Plague by; but in a brisk, active, quick, piercing, subtile, aereal Poyson.

But when it meets with good Blood, whose Particles by this Salt are closely combined together, its Effects appear most by Stagnating the Bile, (though perhaps not directly so as some great Men have imagined:) So that the Symptoms I must confess differ in both, as well as they do in several other Diseases; which difference of Symptoms in Diseases does often arise, not so much from the different Nature of

Vide Willis *de Ifeve.*

of the Diſeaſe, as from the different Nature of the ſolid Parts or Humors of our Body, as to Strength, or Weakneſs, Combination, or Relaxation in ſeveral different and diſtinct Conſtitutions.

It will not perhaps be thought ſo generous in me to engage againſt either of the two late diligent Enquirers into the Nature of this Animal; who, like two expiring Combatants, by mutual Wounds, have ruined one another, having given ſuch demonſtrative Experiments againſt each other,

that unleſs the Vipers of *Italy* have their Poyſon in the Yellow Liquor, and thoſe of *France* theirs in the inraged Spirits, (which I can never believe) neither of their Opinions can poſſibly be true.

Letting therefore theſe two Gentlemen alone to their irreconcilable (though friendly Debate) it will not perhaps be thought amiſs, if I give a ſhort Account of our common Adder, the true *Engliſh* Viper; who, although by ſome ſhe is thought not ſo dangerous as thoſe of hotter Countries, yet whoever will

will but obſerve the dreadful Symptoms that did enſue upon the poor Man of *Warwick*, being bitten as Dr. *Stubs* mentions, whom I have alſo ſent for, and enquired of, will perhaps be quite of another mind: As to the dangerous biting of our Adder, if preſent Pain, extraordinary Swellings, if Benumnedneſs, Bliſters, Blackneſs, Deadneſs, Gangreen, cold death Sweats, *&c.* may be thought ſo.

He told me the Story, juſt as Dr. *Stubs* relates it, very certainly and confidently affirming, That it was the

ſucking of the Venom (as he called it) from the bitten place, that made his Speech falter, and his Tongue ſwell; which the Doctor confeſſes, and therefore tells us how unſafe that Direction of *Celſus*, *Veſſalius*, *Forreſtus*, and others is, who adviſe that a Man ſhould ſuck the bitten place; and in *Amatus Luſitanus* you will find (ſaith he) a relation of one who died by ſucking of the place bitten by a Viper: The ſame is avowed by *Matthiolus*, as *Paræus* recordeth the Story out of him, and inſtanceth further in a Patient

tient of his own, whoſe Life was much endangered by ſucking upon the bite of an Adder. Nay, Dr. *Stubs* confeſſeth, as in the laſt Page, that there is a Virulency in the Wound, as appears, ſaith he, by the evil Accidents upon the ſucking; and yet notwithſtanding he jumps after *Charas*, and tells us, That it ſeems to him indubitable, that the Venom of this Animal proceeds from its Indignation: Which Opinion *Poterius*, *Helmont*, and *Zwelfer* propoſed before *Charas*.

I wiſh theſe Gentlemen had better explained their own Opinions, and more plainly declared what they mean by Enraged Spirits, Indignation, Idea, and the like terms; and, but probably (at leaſt) have ſhown us how theſe, or any of them are convey'd into the Body, and ſo conducted in it, as to produce theſe many various and ſtrange Effects immaterially; for if they conſeſs theſe Enraged Spirits have a Vehicle, they grant all, and ſufficient for me to affirm, that That Vehicle, whatever it is, is of its

its ſelf able, proper, and fit to produce theſe ſtrange and dreadful Symptoms.

I am indeed ſo far of *Signior Redi*'s mind, as to believe there is ſome Venom, or Virulent Juice, or Matter, does attend the Teeth of an Adder when ſhe bites; as I have obſerved a little moiſture to attend the ſting of a Bee, which will cauſe ſtrange Swellings, though the Sting does not remain behind, the Sting has done its buſineſs, and made a paſſage to put in that little Venom, which I hope they will not call the Inraged Spi-

Spirits, Indignation, or the Idea of the Bee. Now, what that moisture is? From whence it cometh? Which way it passes, in the Body of the Bee? What Sort of Bees only have it? What Taste it has? What Effects both this, and the Adders clear moisture have when mixt with Acids, or Alkalies? might be material here more strictly to examine; especially the Effects they have on human Blood, Chyle, Serum, Lympha, &c.

But to return to our Adder, I will put the Matter

ter to a fair iſſue, by a few certain Experiments:

Firſt, By giving the ſeveral and diſtinct Parts of Adders to Dogs, Cats, Crows, *&c.* I found that no particular Part was hurtful to thoſe Creatures.

Secondly, By making angry Adders bite on the ends of well polliſhed Sticks, I found a thin (not yellow) but a clear tranſparent Water left behind, on the place where they had endeavoured to bite.

Thirdly,

Thirdly, I found that the place bit (in a living Creature) always Swelled, look'd Black, and the Blood seemed to Coagulate.

Now I confess here seemed a great difficulty; for if this thin, transparent Water is the Venom, from whence can it come? since there is nothing Poysonous in the Adder when dead, and taken inwardly by these Creatures; not the least Sickness, or Illness appearing in them, upon taking even the most suspected

part

part of this dangerous Serpent.

Beſides this, the Adder haſtily purſuing, catching, and (in a ſeeming Rage) biting hard upon the Neck of a large Field-Mouſe, no more Effect afterwards appeared upon the bitten place, than if her Neck had been pierced by four ſmall Teeth of any other Creature.

To enquire therefore from whence this Water came, I look'd within the Mouth of an Adder, but I ſaw no ſhew of any ſuch Water; then I took out her Tongue, com-

commonly (though falſly) termed her Sting, which I found divided into two Forks, each about half an Inch long apiece, both of a very black Colour, which continued ſo after the two Forks were united into the ſame Stem, or Trunk; which Tongue I found plac'd exactly under the *Larinx*, or entrance of the *Aſpera Arteria*; ſo that under this *Larinx*, when alive, ſhe could withdraw, and nimbly hide her forked Tongue, leaving a free and open paſſage from the *Larinx* to her Teeth and Jaws. Next I carefully obſerved

ſerved both Jaws, which to me ſeemed double; the one Jaw having at leaſt eight or ten very ſmall Teeth; and the other not above two on each ſide, but very long, in compariſon to the other, and plac'd over againſt a vacant place in the other Jaw; moſt of them (eſpecially the great ones) bending inward, much like the Talons of a Hawk, or Kite; and when I viewed them in a Microſcope, they ſeemed more like the forementioned Talons, than the Teeth of other Creatures.

I look'd for the yellow Juice at the Roots of the Teeth, and in the hollow part of the Jaws, which I then found not, I only found there ſome florid Blood, mixt with a kind of Water, like its *Serum*, but of both a very ſmall quantity.

I ſearch'd the *Ductus Salivares*, and their *Glandulæ* for this Water; all which appearing very white, and nothing yellowiſh at all in them, their whiteneſs I ſuppoſe they received from the pure whiteneſs of the *Saliva* contained in them: And thus

thus I was, as I thought, fruſtrate of finding the clear Liquor before-mentioned; for from the Nerves, or Lymphatick Veſſels, although they were viſible enough, yet for many reaſons I thought it moſt improbable for any of them to carry ſuch a Liquor forth unto the Teeth.

In the next biting of an Adder I obſerved two things: *Firſt*, That ſhe held her Chaps, in the very inſtant of biting, to the place ſhe bit upon, ſo exactly cloſe, that nothing either of Breath

or Water could paſs out that way, her Mouth and Lips ſeeming naturally fitted for that purpoſe.

Secondly, I diſcerned an apparent Motion of Expiration, at the very inſtant of biting; which being upon the Throat of a ſtrong Dog, of a thick Skin, I ſuppoſe the Teeth entred only the two Skins, and yet a Tumor preſently aroſe, to the bigneſs of a large Bladder; whereupon I cauſed that Adder and another to bite the ſame Dog in another place, always taking care at the time

time of biting to hinder expiration ſome way or other, as well as I could; and I always found that either the biting had no Effect, or elſe the Adder had no mind to bite, though never ſo much inraged before; nay, though with great force I ſqueezed the Teeth into the place they were faſtned unto, that they might enter very deep, holding his Chaps very hard together between my Finger and Thumb, and preſſing both the over and lower Jaw together; yet no conſiderable Effect would follow, except the Adder had the li-

berty of his own way of biting, and close shutting of his Lips to the bitten place.

Whereupon I began for to suspect, that the very dangerous biting of our Adder, was truly caused from her Breath, and the close shutting of her Mouth, and forcing either depraved Breath, or the steams of such Breath into the Body, by those little Orifices, which the very action of biting seemed more fully to declare.

In which Opinion I was the more confirmed, when in-

inſpecting the Wind-pipe, I found two great Recipients for Air; but the Lungs ſo conveniently ſituate in this Animal, as it were to deprive the deſcending Air, of the greateſt part of this Aereal Salt, which they naturally will do, beyond any thing that Art can perform: And therefore, ſaith a learned Author, *Aer è pulmonibus egeſtus, reſpirationi, vitæque ſuſtentandæ nequaquam idoneus eſt. Circa reſpirationis ergo uſum affirmare fas ſit, nonnihil, quicquid ſit, Aereum ad vitam ſuſtinendam neceſſarium, in ſanguinis maſſam tranſire. Hinc*

Aer è pulmonibus egestus, è quo particulæ istæ Vitales exhauriuntur, non amplius ad respirationem idoneus est.

And the Air being thus deprived, we may from what I have said conclude, that it will naturally deprave; for as the Air in Mines, deprived of this Nitrous Salt, and pent close up, is the true Damp; so this Air in our Adder, deprived by the Lungs of its wholesome parts, is the true Venom, or Verulency, as some phrase it. For,

By the contraction of this long Bladder, and of their neat

neat *Anulares*, together with the extraordinary length of their Wind-pipe, and the cloſe ſhutting of their Mouths to the place bitten; the deprived Air is forc'd with their Teeth into the wounded or bitten place, and by this Motion through the Wind-pipe, either from the Sides or *Glandulæ* bring that clear Lympha along with it.

And thus having given a conſiderable inſtance, to ſhew the true Nature of a Peſtilential Conſtitution, to conſiſt in an Aereal Deprivation, ariſing from a Defect of this Salt, 'tis as eaſie to con-

ceive, as in the Adder, how the ſame Deficiency is made in the Air we breath in, and what Effect that Deficiency will have upon the Humors of our Body.

I do not by all this deny the Exiſtence of ſeveral Subterraneous Steams, or Exhalations, no queſtion but that they are ready to croud in, upon the leaſt defect of this Aereal Salt; and to render the Air more or leſs depraved, either as the Air is more or leſs defective to make room for them; or they in their own Nature are more or leſs pernicious; For as

in

in Subterraneous Damps, according to the different Nature or Quality of the Mines, ſo on the Surface of the Earth, (according to the variety of the Soils) on the defect of theſe Nitro-Aereal Particles, ſeveral Heterogeneous Steams do get into their places, and very ill ſupply the defect of this moſt uſeful Salt.

CHAP.

Chap. VI.

But some may enquire, perhaps, from whence all this Nitro-Aereal Salt should come, with which it is very manifest the Air we breath does so plentifully abound? In answer to which Enquiry, I do confess, I am inclined to believe, that this Nitro-Aereal Salt, which does so evidently abound in wholsom Air, is Chymically raised and sublimed from the Sea

Sea by the Sun's Heat; the more Volatile part carrying with it the groſſer part beforementioned: And this I am ſtill more inclined to believe, when I conſider Salt-Petre it ſelf is only *Sal Gemma*, or Sea Salt, more abounding with Volatile Aereal Spirits; as, indeed, there is great reaſon for it why it ſhould.

Others may enquire what it is that does moſt cauſe a Defect, and conſequently an ill and a depraved Air? To which I anſwer, Not all thoſe Mutations of the Air obſerved by *Hippocrates*, and his fol-

followers, nor all those notable Alterations of the Air mentioned more particularly by *Silvius de le Boe*, and his Scholars, have this Operation or Effect upon the Air, as by diligent Observation I can yet find, but only some of them have; especially an extreme, great, long, or lasting cold Frost: An extreme, great, long and lasting Heat, Driness, or Moisture, in the like manner; any one of these, accompanied with a long quietness or tranquillity of the Air, may first cause a Defect, *&c.* As for Example, in the canicular

nicular Days, when the over-violent Sun's heat hath too much rarified and ſublimed this Salt, that we can ſcarcely breath, then Defects, and Depravations, Death, and Ruine are very apt to follow one another, which have much ſooner an Effect on ſome Conſtitutions than others, according to the various Conſiſtency, or Diſlocation, Combination, or Relaxation, Firmneſs, or Weakneſs of the Particles of the Blood or Humors.

And this I take to be the true reaſon of our ſo frequent Autumnal Epidemick Fe-

Fevers, although they are perhaps not ſuddenly felt at that time, (in the Canicular Days) but ſtay longer before they appear, they are ſo much the worſe for it, and argue that the former Deprivation has had a longer time to deprave, according (as it falls out) ſometimes to deprave both the Air and Humors of our Body; and when the returning Cold, and more plentiful Aereal Salt, does begin to bind up the relaxed Particles of Blood, the depraved Particles of ſo diſagreeing Nature, muſt needs cauſe a very

very dangerous Conjunction; ſince in their own Nature they are not only very different, but alſo very deſtructive to thoſe other Particles of our Blood and Humors, and yet they are got ſo crouded in, and aſſociated amongſt them, that they are very difficult to remove.

To ſumm up what I have ſaid in a few words, The Diſeaſes and Diſturbances that we find in our Bodies, do not ariſe from the ſolid Parts (except it be from ſome hurt or violence from without) nor from a quarrel

rel or disagreement amongst the Humors or fluid Parts of our Body, but from a Defect of this Aereal Salt, which gives occasion to Heterogeneous Steams to croud both into the Air and Humors of our Body, and in time to contaminate and deprave one another; from whence generally Diseases, Epidemick and Pestilential Fevers do arise, so destructive and pernicious unto Mankind; so that the want of this Aereal Salt, is *causa per accidens privativa*; that is, *per sui absentiam causa*, as the old Philosophers are wont to

to ſpeak of all the Diſeaſes and Diſturbances in Man's Body.

Now although hitherto I may ſeem to diſcourage both Phyſicians and their Patients, becauſe no Advice or Counſel can ſecure us always againſt ill Air; I mean Air deficient or depraved; yet we may by the wiſe and learned Phyſician's Advice, be taught how in part either to correct ill Air, or avoid it, or at leaſt how to fortifie the Humors of our Body againſt it; and when nevertheleſs ill Air is got into our Blood and Hu-

mors, and the Particles of our Blood are ill affected by it, then to assist Nature *Materiæ morbificæ exterminatione.*

So that here is nothing to discourage either, but rather to remind them, that Ἔυπνοιαν χρὴ νομίζειν κάρτα μεγάλην δύναμιν ἔχειν, &c.

Far be it from me to seem to lessen the overruling Power of God Almighty by all this, I rather shew how easie a thing it is for him by a Defect or Depravation, to destroy the World and all Mankind together in a moment, as well

well as to puniſh one particular Place or Country.

According to theſe Principles I have laid down, I cannot but recommend an open, free, and uninterrupted Air, a ſandy Soil, a ſituation upon the higheſt Ground, free from Hills, Woods, or any thing elſe that may intercept this Sweet and Balſamick Air: And I wonder that our Anceſtors did ſo little regard theſe things, when even ſome of the Poets took notice of it. As *Lucan*, deſcribing the Plague in *Pompey*'s Army, tells us, how free *Cæſar*'s (though near

him) was from it upon the higher Ground, while it raged in *Pompey*'s Army below;

At liber terræ ſpatioſis collibus hoſtis
Aere non pigro, nec inertibus angitur undis;

which may ſerve for a good Caution to all Encamping Generals.

FINIS.

A Catalogue of ſome BOOKS *printed for, and are to be ſold by* Tho. Baſſett, *at the* George *in* Fleet-ſtreet.

THe *London* Practice of Phyſick, or the whole Practical Part of Phyſick; contained in the Works of Dr. *Willis*. 8*o*.

Pharmacopœia Londinenſis, or the New *London* Diſpenſatory, in Six Books, 8*o*. By *William Salmon*, Profeſſor of Phyſick and Aſtrology. 8*o*.

Doron Medicum: Or, a Supplement to the New *London* Diſpenſatory. In Three Books, 8*o*. By *William Salmon*, Profeſſor of Phyſick and Aſtrology.

Kitchin

Kitchin Phyſick; by way of Dialogue: With Rules and Directions how to prevent Sickneſs, and cure Diſeaſes, by Diet and ſuch things as are daily ſold in the Market. 12o.

An Eſſay concerning Humane Underſtanding: In Four Books. By Mr. *John Lock*. *Fol.*

Remarks in the Grand Tour of *France* and *Italy*, lately performed. By a Perſon of Quality, *&c.* 8o.

An Eſſay of Tranſmigration, in defence of *Pythagoras*; or, a Diſcourſe of Natural Philoſophy, 8o. By *Whitelocke Bulſtrode*, Gent.

The Great *French* Dictionary, in two Parts: The Firſt, *French* and *Engliſh*: The Second, *Engliſh* and *French*, according to the Ancient and Modern Orthography, *&c. fol.* By *Guy Miege*, Gent.

The

The Politicks of *France*. By Monſieur *P. H.* Marquis of *C.* &c. 8*o*.

Poems on ſeveral Occaſions: written by *Charles Cotton*, Eſq; 8*o*.

An Exact Journal of the Siege of *Coni* in *Piemont*, &c. 4*o*. Sent in a Manuſcript from *Turin*, to a Perſon of Quality in *London*.

Two Letters to a Friend; containing certain Conſiderations relating to the Pulpit. 4*o*.

A Sermon preached before the Houſe of Commons at St. *Margaret's*, *Weſtminſter*, on Thurſday the Fifth of *November*. By *William Fleetwood*, Chaplain in Ordinary to Their Majeſties. 4*o*.

Diſcourſes upon Trade, principally directed to the Caſes of the Intereſt, Coinage, Clipping, and Increaſe of Money. 4*o*.

The

The Monarchs of *England* from the Heptarchy, to Their preſent Majeſties King *William* and Queen *Mary*, taken from Medals and Original Paintings; with a Compendious Hiſtory of their ſeveral Reigns. By *Guy Miege*, Gent.

The Effigies of the Right Honourable *Edward Ruſſell*, Eſquire, one of Their Majeſties moſt Honourable Privy Council, Admiral of Their Majeſties Fleet, and Treaſurer of Their Majeſties Navy, *&c.* Taken from the Original, and curiouſly Engraven on Copper. Price 1 *s.*